

WHAT IS CLAIMED IS:

1. A clamp assembly for releasably securing an elongate member having a longitudinal axis to a structural support, the assembly comprising:

a clamp base having a pair of ratchet arms extending outward from the base, each arm having a plurality of ratchet teeth formed along at least one surface thereof and the arms being generally parallel, the clamp base having a first support for the elongate member that includes at least two inclined surfaces forming a generally V-shaped notch that opens in the same direction the arms extend;

a clamping block having openings each of which is sized and located to receive one of the ratchet arms, the clamping block having a pawl located in each opening, the pawl having at least one pawl tooth with the pawl located and configured to releasably engage the ratchet teeth when the ratchet arm extends into the opening a distance sufficient to engage the at least one pawl tooth, the clamping block having a second support for the elongate member that includes at least two inclined surfaces forming a generally V-shaped notch that opens toward the clamp base when the ratchet arms are inserted into the openings; and

at least one cap sized and configured to be placed over the two inclined surfaces forming one of the V-shaped notches, the cap extending over that notch and being interposed between the inclined surfaces and the elongate member during use of the clamp assembly.

2. The clamp assembly of Claim 1, wherein the cap comprises a flexible cap forming a curved surface in the notch.

3. The clamp assembly of Claim 2, comprising a cap on each of the clamp base and clamping block.

4. The clamp assembly of Claim 1, wherein the cap is made of a material having a hardness of about 40-60 Shore A.

5. The clamp assembly of Claim 2, wherein the cap is removable.

6. The clamp assembly of Claim 1, further comprising a first hole extending through the clamp base, the first hole being located between the inclined surfaces of the base and sized to allow the passage of a fastener to fasten the base to the structural support during use of the clamp assembly.

7. The clamp assembly of Claim 6, further comprising a second hole extending through the clamping block, the second hole being located between the inclined surfaces of the clamping block and sized to allow the passage of a fastener to fasten the clamping block to the structural support during use of the clamp assembly.

8. The clamp assembly of Claim 7, wherein the first and second holes are co-axial.

9. The clamp assembly of Claim 1, further comprising a second hole extending through the clamping block, the second hole being located between the inclined surfaces of the clamping block and sized to allow the passage of a fastener to fasten the clamping block to the structural support during use of the clamp assembly.

10. The clamp assembly of Claim 1, further comprising at least two legs on opposing sides of the clamp base and extending therefrom in a direction opposite the ratchet arms, the at least two legs being spaced apart a distance sufficient to allow at least one of the at least two legs to resiliently engage the support when the at least two legs contact the support during use of the clamp assembly.

11. The clamp assembly of Claim 1, further comprising at least one resilient leg and a flange each extending from the clamp base in a direction opposite the ratchet arms, the flange and the at least one leg being spaced apart a distance sufficient to allow the leg to resiliently engage the support when the flange abuts the support, during use of the clamp assembly.

12. The clamp assembly of Claim 10, wherein one of the at least two legs comprises a flange.

13. The clamp assembly of Claim 10, wherein the at least two legs comprise a plurality of resilient legs inclined toward an opposing side of the clamp base and having an engaging lip adjacent a distal end of each leg.

14. The clamp assembly of Claim 13, further comprising holes through at least one leg sized to accommodate a fastener to secure the at least one leg to the support during use of the clamp assembly.

15. The clamp assembly of Claim 1, further comprising a rib on at least one ratchet arm extending a substantial length of the arm to strengthen that arm.

16. The clamp assembly of Claim 9, further comprising at least one resilient leg and a flange each extending from the base in a direction opposite the ratchet arms, the flange and arms being spaced apart a distance sufficient to allow the leg to resiliently engage the support when the flange abuts the support, during use of the clamp assembly.

17. The clamp assembly of Claim 1, further comprising at least one resilient leg and a flange each extending from the base in a direction opposite the ratchet arms, the flange and arms being spaced apart a distance sufficient to allow the leg to resiliently engage the support when the flange abuts the support, during use of the clamp assembly, the flange having at least one

opening therethrough which opening is sized to allow passage of a fastener to fasten the flange to the support during use of the clamp assembly.

18. The clamp assembly of Claim 1, further comprising at least one resilient leg and a flange each extending from the base in a direction opposite the ratchet arms, the flange and arms being spaced apart a distance sufficient to allow the leg to resiliently engage the support when the flange abuts the support, during use of the clamp assembly, the leg having a distal end that is directed away from the flange.

19. The clamp assembly of Claim 1, further comprising a flange at right angles to the base and extending toward the arms, with at least one hole in the flange sized to allow passage of a fastener to fasten the base to the support during use of the clamp assembly.

20. The clamp assembly of Claim 1, wherein each pawl is formed by two adjacent slots in a wall in the clamping block which wall defines a portion of the opening in which the pawl is located, the slots extending to an opening onto a distal edge of the clamping block opposite a base of the pawl, so the pawl is connected to the clamping block only at the base.

21. The clamp assembly of Claim 11, wherein each pawl is formed by two adjacent slots in a wall in the clamping block which wall defines a portion of the opening in which the pawl is located, the slots extending to an opening onto a distal edge of the clamping block opposite a base of the pawl, so the pawl is connected to the clamping block only at the base.

22. The clamp assembly of Claim 1, wherein the elongate member comprises a plumbing pipe.

23. The clamp assembly of Claim 11, wherein the elongate member comprises a plumbing pipe.

24. The clamp assembly of Claim 16, wherein the elongate member comprises a plumbing pipe.

25. A clamp assembly for releasably securing an elongate member having a longitudinal axis to a structural support, the assembly comprising:

a clamp base having a pair of arms extending outward from the base, each arm having a plurality of ratchet teeth formed along at least one surface thereof and the arms being generally parallel, the clamp base having a first support means for holding the elongate member during use of the clamp assembly;

a clamping block having openings each sized and located to receive one of the ratchet arms, the clamping block having a pawl located in each opening, the pawl having at least one pawl tooth, the pawl located and configured to releasably engage the ratchet teeth when the ratchet arm extends into the opening a distance sufficient to engage the at least one pawl tooth, the clamping block having second support means for supporting the elongate member during use of the clamping assembly; and

cap means cooperating with at least one of the first and second support means to support the elongated member during use of the clamp assembly.

26. The clamp assembly of Claim 25, wherein the cap means further provides means for reducing acoustic noise.

27. The clamp assembly of Claim 25, further comprising at least one resilient leg means on the base for releasably engaging a support during use of the clamping assembly.

28. The clamp assembly of Claim 25, further comprising hole means for fastening the base to a structural support during use of the clamping assembly.

29. The clamp assembly of Claim 25, wherein the clamp base and clamping block are molded from the same material.

30. The clamp assembly of Claim 25, wherein the pawl is formed in a wall of the clamping block which wall defines the opening, the pawl being formed by two parallel slots in the wall which slots extend to a distal edge of the opening.

31. The clamp assembly of Claim 25, wherein the elongate member comprises a plumbing pipe.

32. The clamp assembly of Claim 25, further comprising at least one resilient leg and a flange each extending from the clamp base in a direction opposite the ratchet arms, the flange and arms being spaced apart a distance sufficient to allow the leg to resiliently engage the support when the flange abuts the support, during use of the clamp assembly.

33. The clamp assembly of Claim 27, wherein one of the at least one leg means comprises a flange.

34. The clamp assembly of Claim 27, wherein the at least one leg means comprises a plurality of resilient legs inclined toward an opposing side of the clamp base and having an engaging lip adjacent a distal end of each leg.

35. The clamp assembly of Claim 34, further comprising at least one hole through at least one leg sized to accommodate a fastener to secure the at least one leg to the support during use of the clamp assembly.

36. The clamp assembly of Claim 25, further comprising a rib on at least one arm extending a substantial length of the arm to strengthen that arm.

37. A method for releasably securing a plumbing pipe having a longitudinal axis to a structural support, the method comprising:

fastening a clamp base to the structural support, the clamp base having a pair of ratchet arms extending outward from the base, each arm having a plurality of ratchet teeth formed along at least one surface thereof and the arms being generally parallel, the base having a first support for the elongate member that includes at least two inclined surfaces forming a first, generally V-shaped notch that opens in the same direction the arms extend;

fastening a clamping block to the ratchet arms, the clamping block having two openings each sized and located to receive one of the ratchet arms, the clamping block having a pawl located in each opening, the pawl having at least one pawl tooth with the pawl located and configured to releasably engage the ratchet teeth as each ratchet arm extends into one of the openings a distance sufficient to engage the at least one pawl tooth, the clamping block having a second support for the pipe that includes at least two inclined surfaces forming a second, generally V-shaped notch that opens toward the clamp base and pipe;

placing the pipe between the ratchet arms and first and second V-shaped notches either before or after the clamping block is fastened to the ratchet arms;

interposing at least one cap between the pipe and at least one of the base and clamping block by placing the cap over at least one of the first and second notches with the cap being sized and configured to engage a portion of the inclined surfaces forming the notch over which the cap is placed.

38. The method of Claim 37, comprising forming the cap of a flexible material and forming a curved surface in the notch over which the cap is placed.

39. The method of Claim 37, wherein the interposing step further comprises placing two caps, one cap on each of the V-shaped notches, and advancing at least one of the clamp base and clamping block toward the other until the pipe is supported by at least one of the caps.

40. The method of Claim 37, comprising using a cap made of a material having a hardness of about 40-60 Shore A.

41. The method of Claim 37, further comprising temporarily holding the base to the structural support by placing the support between at least one resilient leg and a flange each extending from the base in a direction opposite the ratchet arms, the flange and the at least one leg being spaced apart a distance sufficient to allow the at least one leg to resiliently engage the structural support when the flange abuts the support and is interposed between the flange and the at least one leg.

42. The method of Claim 37, further comprising temporarily holding the base to the structural support by placing the support between at least two resilient legs each extending from the base in a direction opposite the ratchet arms, the at least two legs being spaced apart a distance sufficient to allow at least one of the legs to resiliently engage the support when the at least two legs abut the support and the support is interposed between the at least two legs.

43. The method of Claim 37, further comprising temporarily holding the base to the structural support by placing the support between a plurality of resilient legs extending from opposing sides of the base in a direction opposite the ratchet arms, the legs having different lengths with an engaging lip adjacent a distal end of each leg to engage an edge of the support when said lip is resiliently urged against said edge.

44. The method of Claim 42, further comprising placing a fastener through one of the at least one legs to secure that leg to the support.



45. The method of Claim 41, further comprising fastening the clamp base to the support by placing a fastener through a first hole extending through the clamp base, the first hole being located between the inclined surfaces of the base.

46. The method of Claim 37, further comprising fastening the clamp base to the support by placing a fastener through a first hole extending through the clamp base, the first hole being located between the inclined surfaces of the base.

47. The method of Claim 37, further comprising fastening the clamping block to the support by placing a fastener through a second hole extending through the clamping block, the second hole being located between the inclined surfaces of the clamping block.

48. The method of Claim 37, further comprising fastening the base to the support by placing a fastener through a hole in a flange that extends from the clamp base at right angles to the clamp base and toward the arms.

49. The method of Claim 37, further comprising forming at least one pawl by forming two adjacent slots in a wall in the clamping block which wall defines a portion of the opening in which the pawl is located, and extending the slots to an opening onto a distal edge of the clamping block opposite a base of the pawl so the pawl is connected to the clamping block only at the base of the pawl.

50. The method of Claim 37, wherein the pawl is formed by two adjacent slots in a wall in the clamping block which wall defines a portion of the openings, the slots extending to an opening onto a distal edge of the clamping block opposite a base of the pawl, so the pawl is connected to the clamping block only at the base.

51. A clamp assembly for holding a pipe having a longitudinal axis to a support, the assembly comprising:

a clamp base having two parallel arms extending outward from the base;

a clamp base pipe support extending outward from the clamp base in the same direction as the arms and located between the arms, the clamp base pipe support having two opposing ends with each end being adjacent one of the arms, the clamp base pipe support having a middle with the ends of the clamp base pipe support extending further outward than the middle;

a clamping block having two holes therethrough, each hole sized and aligned to receive one of the arms;

a latch mechanism in each hole on the clamping block located to releasably engage the arm received in that hole;

a clamping block pipe support extending outward from the clamping block toward the clamp base during use of the clamp assembly, the clamping block pipe support having two opposing ends with each end of the clamping block pipe support being adjacent one of the holes in the clamping block, the clamping block pipe support having a middle with the ends of the clamping block pipe support extending further outward than the middle;

a flange extending outward from the clamp base in a direction opposite the arms;

a member extending outward from the clamp base in a direction opposite the arms, the member being resiliently disposed toward the flange and being spaced apart from the flange by a distance less than a width of the support at a location where the clamp assembly is to be mounted during use of the clamp assembly in order to resiliently hold the clamping base to the support during use of the assembly.

52. The clamp assembly of Claim 51, wherein the member has a distal end that is curved away from the flange.

53. The clamp assembly of Claim 51, further comprising at least one of:

a first cap engaging and extending between the two ends of the clamp base pipe supports to support the pipe during use of the clamp assembly; and

a second cap engaging and extending between the ends of the clamping block pipe supports to support the pipe during use of the clamp assembly.

54. The clamp assembly of Claim 51, wherein the latch mechanism comprises a pawl having a base forming a portion of a wall defining the hole, the pawl having sides defined by generally parallel slots in the wall and having a free end that extends outward from the clamping block a distance sufficient to be manually engaged to move the pawl, the pawl having at least one pawl tooth that releasably engages ratchet teeth on one of the arms to releasably hold the arm relative to the pawl and clamping block.

55. A clamp assembly for holding a pipe having a longitudinal axis to a support, the assembly being oriented along an axis orthogonal to the longitudinal axis, the assembly comprising:

a clamp base;

a clamping block;

two parallel arms extending outward from one of the clamp base and the clamping block and located on opposing sides of the orthogonal axis during use of the clamp assembly;

two holes in the other of the clamp base and the clamping block with each hole being sized and located to receive one of the arms, the two holes being located on opposing sides of the orthogonal axis during use of the clamp assembly;

a clamp base pipe support extending outward from the clamp base, the clamp base pipe support having two opposing ends located on opposing sides of the orthogonal axis during use of the clamp assembly and located between that orthogonal axis and the arms and holes during use of the clamp assembly, the clamp base pipe support having a middle with the ends of the clamp base pipe support extending further outward than that middle;

a clamping block pipe support extending outward from the clamping block toward the clamp base during use of the clamp assembly, the clamping block pipe support having two opposing ends located on opposing sides of the orthogonal axis during use of the clamp assembly and located between that orthogonal axis and the arms and holes during use of the clamp assembly, the clamping block pipe support having a middle with the ends of the clamping block pipe support extending further outward than that middle;

a latch mechanism located in each hole to releasably engage the arm received in that hole;

a flange extending outward from one of the clamp base and the clamping block, the flange extending in a direction opposite the arms;

a member extending outward from the one of the clamp base and the clamping block from which the flange extends and generally parallel to the flange, the flange and member being located on a side of the one of the clamp base and clamping block that is opposite to the pipe support of the one of the clamp base and clamping block from which the flange and member extend, the member being resiliently disposed toward the flange and being spaced apart from the flange by a distance less than a width of the support at a location where the clamp assembly is to be mounted during use of the clamp assembly in

order to resiliently hold one of the clamping base and clamping block to the support during use of the assembly.

56. The clamp assembly of Claim 55, wherein the arms extend from the clamping block and the member resiliently holds the clamp base to the support.

57. The clamp assembly of Claim 55, wherein the arms extend from the clamp base.

58. The clamp assembly of Claim 55, wherein the member has a distal end that is curved away from the flange.

59. The clamp assembly of Claim 55, further comprising at least one of:

- a first cap engaging and extending between the two ends of the clamp base pipe supports to support the pipe during use of the clamp assembly; and

- a second cap engaging and extending between the ends of the clamping block pipe supports to support the pipe during use of the clamp assembly.

60. The clamp assembly of Claim 57, further comprising at least one of:

- a first cap engaging and extending between the two ends of the clamp base pipe supports to support the pipe during use of the clamp assembly;

- a second cap engaging and extending between the ends of the clamping block pipe supports to support the pipe during use of the clamp assembly.

61. The clamp assembly of Claim 55, wherein the latch mechanism comprises a pawl having a base forming a portion of a wall defining the hole, the pawl having sides defined by generally parallel slots in the wall and having a free end that extends outward from the clamping block a distance sufficient to be manually engage to move the pawl, the pawl having at least one pawl tooth that releasably engages ratchet teeth on one of the arms to releasably hold the arm relative to the pawl and clamping block.

62. A clamp assembly for releasably securing an elongate member having a longitudinal axis to a support, the assembly comprising:

a clamp base having a pair of arms extending outward from the base, each arm having a plurality of ratchet teeth formed along at least one surface thereof and the arms being generally parallel, the clamp base having a first support means for holding the elongate member during use of the clamp assembly;

a clamping block having openings each sized and located to receive one of the ratchet arms, the clamping block having a pawl located in each opening, the pawl having at least one pawl tooth, the pawl located and configured to releasably engage the ratchet teeth when the ratchet arm extends into the opening a distance sufficient to engage the at least one pawl tooth, the clamping block having second support means for supporting the elongate member during use of the clamping assembly;

cap means cooperating with at least one of the first and second support means to support the elongated member during use of the clamp assembly; and

means for temporarily fastening the clamp base to the support during use of the clamp assembly

63. The clamp assembly of Claim 62, further comprising a rib on each of the arms extending a substantial length of each arm to strengthen the arms.

64. The clamp assembly of Claim 63, wherein the rib extends from the same side of the arm as the ratchet teeth with ratchet teeth on opposing sides of the rib and a pawl engages the teeth on each side of the rib.

65. The method of Claim 62, further comprising forming the support of two telescoping parts and interposing a friction member between the parts located to abut one of the telescoping parts and restrain relative motion among the parts.

66. The method of Claim 62, further comprising:

forming the support of two telescoping parts;

forming a leaf spring in one of the telescoping parts; and

deforming the leaf spring to abut the other of the two telescoping parts sufficiently to create friction sufficient to restrain relative motion but allow a user to move the parts relative to each other by hand.